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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/098,630 Confirmation No. : 3713
First Named Inventor : Guenter REICHART
Filed : March 18, 2002
TC/A.U. : 2821
Examiner : Michael C. Wimer

Docket No. : 225/50993
Customer No. : 23911

Title : Vehicle Antenna Arrangement and Method of Making Same

APPEAL BRIEF

Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

June 7, 2005

Sir:

Pursuant to the Notice of Appeal filed February 7, 2005, Appellants herewith submit their appeal brief and appropriate fee in accordance with the provisions of 37 C.F.R. § 1.17(f) and 1.192. A two month extension of time petition under 37 C.F.R. §1.136(a) is also submitted herewith.

I. REAL PARTY IN INTEREST

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This application has been assigned by the inventor to DaimlerChrysler AG, a German corporation. Accordingly, the real parties in interest to the present appeal are the named inventor and DaimlerChrysler AG.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellant, to Appellant's legal counsel or to the assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 3, 5, 7, 27 through 36 and 38 are currently pending in this application, and all have been rejected on prior art grounds as set forth hereinafter. Accordingly, by this appeal, Appellant seeks review of the rejection of Claims 3, 5, 7, 27-36 and 38 as set forth in the Office Action submitted October 6, 2004.

Appellant notes that Office Action of October 6, 2004 has not been made final, in view of the Request for Continued Examination which accompanied the amendment filed July 19, 2004. However, under 37 C.F.R. §41.31, every applicant, any of whose claims have been twice rejected, may appeal from the decision of the Examiner to the Board. Accordingly, this appeal is proper.

IV. STATUS OF AMENDMENTS

Four amendments have been submitted with regard to the present application, dated August 26, 2003, April 7, 2004 and July 19, 2004 (the latter having been accompanied by an RCE, as indicated previously). All such amendments have been entered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention is directed to an antenna arrangement for a motor vehicle having a number of antennas for differing functions, and for operation at different frequencies. (Specification, paragraphs [0007] and [0008].) In

particular, the purpose of the invention is to permit the incorporation of a large number of antennas into a vehicle and the vehicle body, in such a manner that they do not interfere with each other, protrude from the vehicle body or impair its visual or aerodynamic qualities. (Specification, paragraph [0008].)

In the antenna arrangement according to the invention, a plurality of antennas 6 (Figure 1) are incorporated into the outer skin 2 of a vehicle body, which outer skin itself comprises a plurality of components that are fabricated of sheet metal and joined together. The individual antennas, according to the invention, are formed by gaps at the outer skin of the vehicle. Such gaps are formed in two ways. First, they may be provided in the form of joints (4B, Figure 3) or seams which exist between individual sheet metal body components, as discussed in the specification at paragraphs [0010] and [0011]. (See also, paragraph [0026].) Second, such gaps may be provided in the form of cutouts or slots 4B which are formed in the sheet metal from which a particular body component is fabricated. (See paragraphs [0012], [0013], [0026] and [0027].) In either case, the antenna formed at such a gap may be covered over by a material which matches the trim and finish of the vehicle body. (Specification, paragraphs [0012], [0013], [0024] and [0025].)

The latter features of the invention are recited in the claims. In particular, Claim 3 recites that the vehicle outer skin comprises a plurality of body components fabricated of sheet metal, that the antennas are formed at structural gaps in the outer skin, and that the structural gap at which at least

one antenna is arranged comprises “a joint at which individual components of the vehicle outer skin adjoin one another”. Claim 5 is similar, except that the gap is formed by a slot in the sheet metal itself, of which a particular body component is formed. Moreover, the slot is “dimensioned in such a way that the slot itself forms a slot antenna”. Claim 27 is directed to the overall combination of a passenger vehicle which comprises a vehicle body having an outer skin formed by a plurality of metallic body components, with antennas formed at gaps in the vehicle outer skin. In Claim 27, the gaps comprise either a joint at which individual components of the vehicle outer skin adjoin one another, as recited in Claim 3, or a slot which is dimensioned in such a way that the slot itself forms a slot antenna, as recited in Claim 5. Finally, independent Claim 33 is directed to a method of making a passenger vehicle by placing a vehicle outer skin over a vehicle frame, where the vehicle includes a plurality of antennas formed in the manner recited in Claims 3, 5, and 27.

VI. GROUNDS OF REJECTION TO BE REVIEWED

Claim 3 has been rejected under 35 U.S.C. §103(a) as unpatentable over James et al (U.S. Patent No. 5,682,168), while Claims 5 and 27-36 have been rejected as unpatentable over Dörrie et al (U.S. Patent No. 5,177,494) in view of James et al. In addition, Claims 3, 33 and 38 have been rejected as unpatentable over Williams et al (U.S. Patent No. 2,520,986). Appellant hereby seeks review of each of the grounds of rejection set forth above.

VII. ARGUMENT

The James et al reference shows a plurality of antennas 70 and 108,109 which are mounted within the roof support members, such as 74, which is best shown in Figures 2 and 3. Figure 2, for example, shows in particular that the antenna in question consists of a half wave dipole antenna 72 that is mounted inside one of such supports, and is covered with a non-conducting antenna cover 84. In another embodiment, illustrated in Figure 15, the antenna system according to James et al includes five quarter-wave whip antennas 244-252 suspended from the automobile roof.

The Dörrie et al patent, on the other hand, discloses a vehicular antenna system in which a plurality of separate slot antenna units are mounted at various locations about the vehicle body, and are insulated from it. Figure 1, for example, shows three such slot antenna units 12-14 mounted on the body of the vehicle (or within it). (See Column 1, lines 37-57; Column 2, lines 8-26.) As is apparent from Figures 1-4, each of the respective slot antennas (Figure 2) is formed separately and mounted either on or within the interior of the vehicle body.

Finally, the Williams et al reference teaches generally that a radio signal may be picked up by the conducting body of a vehicle. In order to overcome past problems in utilizing the vehicle body in this manner, Williams et al provides inductive pickup loops which are supported on the vehicle body to pick up signals

from "effective loop circuits formed in the vehicle body". (See Column 1, lines 52-55; see also, Column 3, lines 17-26.) Such pickup loops comprise a single elongate turn of wire, 30, as shown in Figure 4, and are secured to the roof supports adjacent the windshield substantially at right angles thereto, as shown in Figure 3. (See Column 3, lines 34-40 and 46-48.) In another embodiment, depicted in Figure 6, the loop is formed by a strip of thin metallic foil 50 which is taped inside the door support of the vehicle body. (See Column 5, lines 8-11.) Together with conductors 52 and 54, the metallic foil 50 forms a closed loop which is equivalent to the loop formed by the wire 30 in Figures 2 and 3, and which serves to receive signals by inductive coupling with the loop circuits inherently formed in the vehicle body, as noted, for example, at Column 5, lines 31-35 and Column 2, lines 30-33.

An important aspect of the Williams et al reference is that the "pick up loops" do not themselves constitute antennas. Rather, they are simply inductive coils which can be placed adjacent the vehicle body and inductively coupled therewith in order to transfer the signal which is received by the inductive loops inherently formed in the vehicle body. (See Column 2, lines 38-50.)

Claim 3 has been rejected under 35 U.S.C. §103(a) as unpatentable over either James et al or Williams et al. However, Claim 3 recites that antennas "are formed in structural gaps in the vehicle outer skin" and furthermore that at least one of the antennas "is arranged in a gap comprising a joint at which

individual components of the vehicle outer skin adjoin one another". The discussion of the James et al reference in paragraph 2 of the Office Action is premised on the language of the claim prior to its most recent amendment, and in particular to the words "structure cutout". This language no longer appears in Claim 3. Moreover, Appellant respectfully submits that the window 38 does not constitute such a "structural cutout", or more particularly, a structural gap in the vehicle outer skin. This is particularly so in that the last paragraph of Claim 3 specifies that the gap comprises a joint at which individual components of the vehicle outer skin "adjoin one another". Appellant respectfully submits that this language does not read on either the window 38 or the space 92 between the metallic roof support member 74 and the plastic cover 84, referred to at Column 4, lines 1-5 of James et al.

Similarly, the Williams et al reference also fails to teach or suggest that antennas are formed in structural gaps in the vehicle outer skin. As noted previously, the "pick up loops" do not themselves constitute antennas. Rather, they are merely circuit components, such as shown in Figure 5, for coupling the radio signals out of the vehicle body 11, and transferring them to a radio receiver 41. In any event, they are not arranged in a "gap" such as defined in the claims.

Claim 5, on the other hand, recites that at least one gap is formed in a slot in one of the metallic body components, and that the slot "is dimensioned in such a way that the slot itself forms a slot antenna". Neither of the Dörrie et al nor

the James reference teaches or suggests such an arrangement. In particular, as noted previously, Dörrie et al simply discloses the idea of mounting separate slot antenna units on a vehicle body or in it, with the antenna elements being insulated from the vehicle body. See, Column 2, lines 8-26 and Figures 2, 3 and 4. It contains no suggestion of providing such a slot antenna in the form of a slot in the vehicle outer skin, nor does it contain any discussion of dimensioning such a slot in such a manner that it functions as a slot antenna. Furthermore, as noted previously, Williams et al merely teaches the broad general idea of using the vehicle body to pick up radio signals. Nowhere in Williams et al is there any discussion of providing slots in the vehicle outer skin to form slot antennas, or the dimensioning of any such slots.

Finally, Claims 27 and 33 are generic to both the "structural gap"/"joint" embodiment of Claim 3, and the slot antenna embodiment of Claim 5. They have been rejected over Williams et al, but distinguish over that reference, for the reasons previously articulated with regard to Claim 3.

CONCLUSION

Appellant therefore respectfully submits that all claims of record in this application distinguish over the cited James et al, Dörrie et al and Williams et al references, and are allowable, for the reasons set forth above. Appellant therefore requests that the Board of Appeals reverse the rejection of these claims and allow the present application.

This Appeal Brief is accompanied by a check including the amount of \$500.00 in payment of the required appeal fee. This amount is believed to be correct, however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 05-1323, Docket No.: 225/50993. A triplicate copy of this Appeal Brief is attached.

Respectfully submitted,



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CLAIMS APPENDIX

Claim 3. Antenna arrangement having a plurality of antennas for different functions and frequencies for a vehicle with a body having a vehicle outer skin, wherein:

said vehicle outer skin comprises a plurality of body components;

the antennas are formed in structural gaps in the vehicle outer skin; and

at least one of the antennas is arranged in a gap comprising a joint at which individual components of the vehicle outer skin adjoin one another.

Claim 5. Antenna arrangement having a plurality of antennas for different functions and frequencies for a vehicle with a body having a vehicle outer skin, wherein:

said vehicle skin comprises a plurality of metallic body components;

the antennas are formed at structural gaps in the vehicle outer skin;

at least one gap is formed by a slot in one of said metallic body components; and

the slot is dimensioned in such a way that the slot itself forms a slot antenna.

Claim 7. Antenna arrangement according to claim 3, wherein:

at least some of said body components are metallic;

at least one gap comprises a slot formed in one of said metallic body components; and

the slot is dimensioned in such a way that it forms a slot antenna.

Claim 27. A passenger vehicle comprising:

a vehicle body having an outer skin formed by a plurality of body metallic components; and

a plurality of antennas having respective different functions and frequency characteristics; wherein

the antennas are formed at gaps in the vehicle outer skin; and

said gaps comprise at least one of a joint at which individual components of the vehicle skin adjoin one another and a slot in one of said metallic body components, which slot is dimensioned in such a way that said slot itself forms a slot antenna.

Claim 28. A passenger vehicle according to claim 27, wherein said antennae include antennas for:

- (a) AM radio reception;
- (b) FM radio reception; and
- (c) a vehicle locking system

Claim 29. A passenger vehicle according to claim 28, wherein said antennas include antennas for:

a GPS system.

Claim 30. A passenger vehicle according to claim 28, wherein said antennas include antennas for:

a mobile telephone.

Claim 31. A passenger vehicle according to claim 28, wherein said antennas include antennas for:

a satellite radio.

Claim 32. A passenger vehicle according to claim 28, wherein said antennas include antennas for:

a distance determining radio system.

Claim 33. A method of making a passenger vehicle comprising:

placing a vehicle outer skin over a vehicle frame said vehicle skin comprising a plurality of metallic body components; and

installing a plurality of antennas having respective different functions and frequency characteristics; wherein

the installing of antennas includes forming the antennas at gaps in said vehicle outer skin; and

said gaps comprise at least one of a joint at which individual components of the vehicle skin adjoin one another, and a slot in one of said metallic body components, which slot is dimensioned in such a way that said slot itself forms a slot antenna.

Claim 34. A method according to claim 33, wherein said antennae includes antennas for:

(d) AM radio reception;

(e) FM radio reception; and

(f) a vehicle locking system

Claim 35. A method of making a passenger vehicle according to claim 33, wherein said installing includes forming at least one of said antennas as a slot antenna disposed in a joint between two parts of the outer skin.

Claim 36. A method of making a passenger vehicle according to claim 33, wherein said installing includes embedding at least one of said antennas in a respective panelling element.

Claim 38. The antenna arrangement according to Claim 3, further comprising panelling members which are mounted on the vehicle outer skin and cover said gaps, wherein:

said panelling members are made from a material which is one of a dielectric material, an insulator material and a material which is permeable to electromagnetic radiation;

said antennas are discrete manufactured elements, which are separate from the panelling members.